

# EXHIBIT D

**Exhibit D****Infringement of U.S. Patent No. 7,130,576 by DISH Accused Satellite Television Services**

#	U.S. Patent No. 7,130,576	DISH Accused Satellite Television Services
<b>14a</b>	14. A method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, the method comprising the steps of:	<p>The Accused Satellite Television Services perform the claimed method utilizing, for example, Signal Selector and Combiner (“SSC”) devices, which include which include SSC-enabled LNBs (for example, DISH Pro Hybrid (“DPH”) LNBFs) and switches (for example, DPH42). By way of example, the DPH42 is charted herein.</p> <p>A plurality of transponder signals are communicated from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU as described below:</p> <p>The DPH42 communicates transponder signals from one or more LNBFs (such as the DP/DPP LNBF or DP LNBF) to an IRD (e.g. a Hopper, Wally, or ViP Receiver) over a single cable.</p>

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		<p>The diagram illustrates a satellite television system architecture. On the left, a red-bordered box labeled "ODU" contains a "dish HD" satellite dish connected to a "DP/DPP LNB" and a "DP LNBF". A blue cable from the ODU connects to a "TechniStar DPH42" receiver. From the DPH42, two single cables emerge: one purple cable labeled "Single Cable" leading to a green-bordered box labeled "IRD" containing a "Hopper, Wally, or ViP Receiver" and a television set; and one blue cable leading to another "IRD" box containing a "Joey" receiver and a television set. A third blue cable from the DPH42 connects to a third "IRD" box containing a "Joey" receiver and a television set.</p> <p>In a variety of installations, the DPH42 has two single cable outputs, each of which is provided to a different receiver network. For example, a first single cable can be provided to a Hopper receiver network (shown in purple) and a second single cable can be provided to a Wally receiver network (shown in blue).</p>

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		<p>Each of the ODUs receives a plurality of satellite broadband signals (highlighted in blue).</p>

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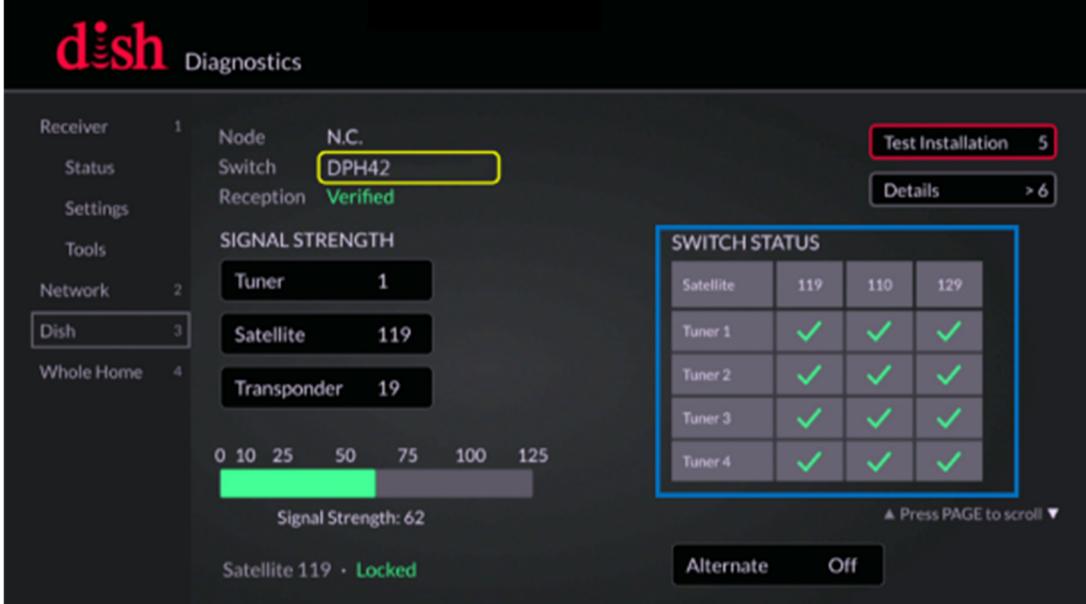
#	U.S. Patent No. 7,130,576	DISH Accused Satellite Television Services
		 <p>The image shows the DISH Diagnostics interface. At the top, it displays 'Receiver' information: Node (N.C.), Status (Switch DPH42), Reception (Verified). To the right are buttons for 'Test Installation' (5) and 'Details' (6). Below this is a 'SIGNAL STRENGTH' section with a bar graph ranging from 0 to 125, showing a value of 62. It includes buttons for 'Tuner 1' (1), 'Satellite 119' (3), and 'Transponder 19' (4). A 'Whole Home' button is also present. To the right is a 'SWITCH STATUS' grid for 'Tuner 1' through 'Tuner 4' across satellites 119, 110, and 129. All entries show a green checkmark. A note at the bottom says 'Signal Strength: 62'. At the bottom right are 'Alternate' and 'Off' buttons.</p>
14b	communicating a transponder request signal to the ODU from the IRD;	<p>The ODU communicates a transponder request signal to the ODU from the IRD as described below:</p> <p>The DPH42 includes a Broadcom BCM4552 SoC.</p>

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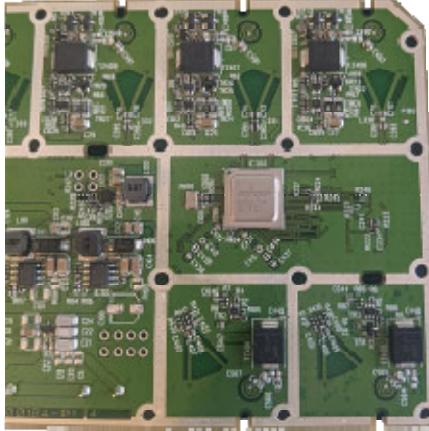
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		 <p>Broadcom's BCM4554 offers a higher level of integration while consuming less power than the previous generation chipset. It also enables direct sampling of low-noise block (LNB) outputs across worldwide ODU satellite markets. The simplified design of Broadcom's new ODU chipset allows 32 DVB-S2 channels to be stacked on a single coaxial cable to service any STB in a home, simplifying and reducing satellite operator installation costs.</p> <p><b>Key Features and Benefits:</b></p> <ul style="list-style-type: none"> <li>• Second generation with reduced power and better integration in 28 nm process</li> <li>• 4 RF Inputs and 1RF output covering the 250 to 2350 MHz frequency range</li> <li>• 32 user-band output channels</li> <li>• 32 output channels selectable from any LNB input</li> <li>• Frequency shift keying (FSK) and digital satellite equipment control (DiSEqC)</li> </ul>
14c	in the ODU, digitizing the plurality of satellite broadband signals, selecting and extracting a plurality of transponder signals from the received digitized satellite broadband signals, wherein the selecting is responsive to the transponder request signals as described below:	The ODU digitizes the plurality of satellite broadband signals, selects and extracts a plurality of transponder signals from the received digitized satellite broadband signals, wherein the selecting is responsive to the transponder request signals as described below:

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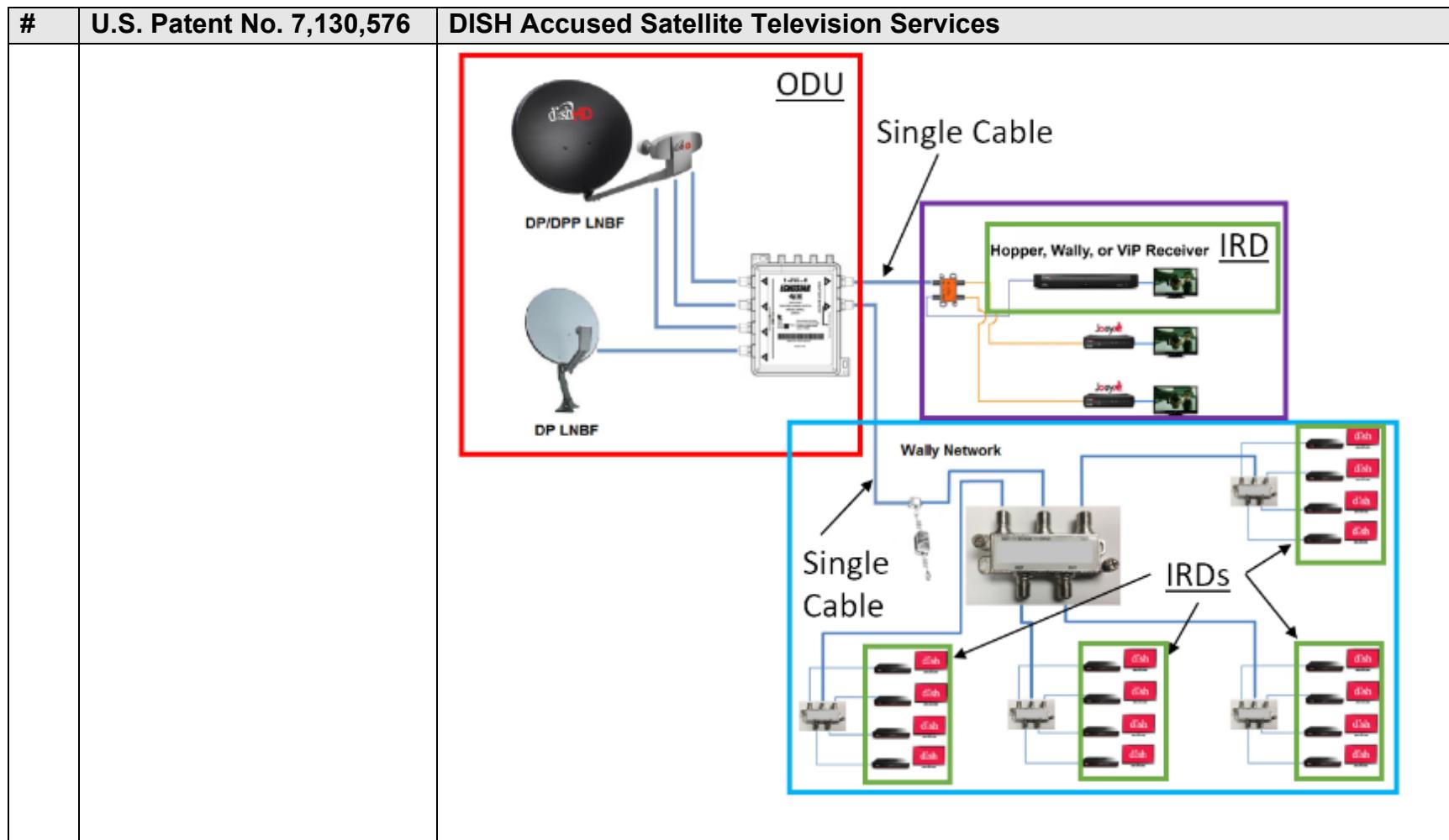
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	digitized satellite broadband signals, wherein the selecting is responsive to the transponder request signals;	<p>Inputs from Satellite Dish</p>

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		<p>Analog-to-Digital Converters Converting Signals from Satellite Dish</p> <p>Technology Advantages:</p> <ul style="list-style-type: none"> <li>• <u>Drives future TV</u>: leapfrogs current analog architecture by moving to digital and supporting up to 24 minimally spaced channels; opens up the ability to stream independent HD broadcast streams and IP services from a single cable to multiple connected devices, delivering next-generation satellite TV.</li> <li>• <u>Simplifies installation and upgrades</u>: Broadcom's stacked channel technology allows single cable installation, which significantly reduces the cost and complexity for installs and upgrades with better home theater aesthetics for subscribers.</li> <li>• <u>Full-Band Capture (FBC)</u>: Broadcom's digital tuning technology digitizes the entire spectrum enabling more efficient and flexible distribution of video streams and IP services.</li> <li>• <u>Lower system cost</u>: replaces multiple analog ODU chips with a single lower cost mixed signal chip.</li> </ul>
14d	combining extracted selected transponder signals into a composite signal;	The ODU combines extracted selected transponder signals into a composite signal as described below:

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		<p><b>Technology Advantages:</b></p> <ul style="list-style-type: none"> <li>• <u>Drives future TV:</u> leapfrogs current analog architecture by moving to digital and supporting up to 24 minimally spaced channels; opens up the ability to stream independent HD broadcast streams and IP services from a single cable to multiple connected devices, delivering next-generation satellite TV.</li> <li>• <u>Simplifies Installation and upgrades:</u> Broadcom's stacked channel technology allows single cable installation, which significantly reduces the cost and complexity for installs and upgrades with better home theater aesthetics for subscribers.</li> <li>• <u>Full-Band Capture (FBC):</u> Broadcom's digital tuning technology digitizes the entire spectrum enabling more efficient and flexible distribution of video streams and IP services.</li> <li>• <u>Lower system cost:</u> replaces multiple analog ODU chips with a single lower cost mixed signal chip.</li> </ul>
<b>14e</b>	transmitting the composite signal over the single cable from the ODU to the IRDs, wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.	The ODU transmits the composite signal over the single cable from the ODU to the IRDs, wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting as described below:

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		<p><b>Technology Advantages:</b></p> <ul style="list-style-type: none"> <li>• <u>Drives future TV</u>: leapfrogs current analog architecture by moving to digital and supporting up to 24 minimally spaced channels; opens up the ability to stream independent HD broadcast streams and IP services from a single cable to multiple connected devices, delivering next-generation satellite TV.</li> <li>• <u>Simplifies installation and upgrades</u>: Broadcom's stacked channel technology allows single cable installation, which significantly reduces the cost and complexity for installs and upgrades with better home theater aesthetics for subscribers.</li> <li>• <u>Full-Band Capture (FBC)</u>: Broadcom's digital tuning technology digitizes the entire spectrum enabling more efficient and flexible distribution of video streams and IP services.</li> <li>• <u>Lower system cost</u>: replaces multiple analog ODU chips with a single lower cost mixed signal chip.</li> </ul>
15	15. The method of claim 14 wherein the step of selecting and extracting a transponder signal comprises the step of: filtering a transponder signal with a band pass filter having a bandwidth ranging from 5% to 100% wider than the bandwidth of the transponder signal.	<p>Upon information and belief, the step of selecting and extracting a transponder signal comprises the step of: filtering a transponder signal with a band pass filter having a bandwidth ranging from 5% to 100% wider than the bandwidth of the transponder signal as described below:</p> <p><b>Technology Advantages:</b></p> <ul style="list-style-type: none"> <li>• <u>Drives future TV</u>: leapfrogs current analog architecture by moving to digital and supporting up to 24 minimally spaced channels; opens up the ability to stream independent HD broadcast streams and IP services from a single cable to multiple connected devices, delivering next-generation satellite TV.</li> <li>• <u>Simplifies installation and upgrades</u>: Broadcom's stacked channel technology allows single cable installation, which significantly reduces the cost and complexity for installs and upgrades with better home theater aesthetics for subscribers.</li> <li>• <u>Full-Band Capture (FBC)</u>: Broadcom's digital tuning technology digitizes the entire spectrum enabling more efficient and flexible distribution of video streams and IP services.</li> <li>• <u>Lower system cost</u>: replaces multiple analog ODU chips with a single lower cost mixed signal chip.</li> </ul>

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16	16. The method of claim 14 wherein the step of combining comprises frequency translating the selected and extracted transponder channels to a variable frequency before combining.	<p>Upon information and belief, the step of combining comprises frequency translating the selected and extracted transponder channels to a variable frequency before combining as described below:</p> <p><b>Technology Advantages:</b></p> <ul style="list-style-type: none"> <li>• <i>Drives future TV</i>: leapfrogs current analog architecture by moving to digital and supporting up to 24 minimally spaced channels; opens up the ability to stream independent HD broadcast streams and IP services from a single cable to multiple connected devices, delivering next-generation satellite TV.</li> <li>• <i>Simplifies installation and upgrades</i>: Broadcom's stacked channel technology allows single cable installation, which significantly reduces the cost and complexity for installs and upgrades with better home theater aesthetics for subscribers.</li> <li>• <i>Full-Band Capture (FBC)</i>: Broadcom's digital tuning technology digitizes the entire spectrum enabling more efficient and flexible distribution of video streams and IP services.</li> <li>• <i>Lower system cost</i>: replaces multiple analog ODU chips with a single lower cost mixed signal chip.</li> </ul>
17	17. The method of claim 15 further comprising frequency translating the selected transponder channels to a predetermined frequency before combining.	<p>Upon information and belief, the ODU frequency translates the selected transponder channels to a predetermined frequency before combining as described below:</p> <p><b>Technology Advantages:</b></p> <ul style="list-style-type: none"> <li>• <i>Drives future TV</i>: leapfrogs current analog architecture by moving to digital and supporting up to 24 minimally spaced channels; opens up the ability to stream independent HD broadcast streams and IP services from a single cable to multiple connected devices, delivering next-generation satellite TV.</li> <li>• <i>Simplifies installation and upgrades</i>: Broadcom's stacked channel technology allows single cable installation, which significantly reduces the cost and complexity for installs and upgrades with better home theater aesthetics for subscribers.</li> <li>• <i>Full-Band Capture (FBC)</i>: Broadcom's digital tuning technology digitizes the entire spectrum enabling more efficient and flexible distribution of video streams and IP services.</li> <li>• <i>Lower system cost</i>: replaces multiple analog ODU chips with a single lower cost mixed signal chip.</li> </ul>

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18	18. The method of claim 14 further comprising the step of splitting the composite signal inside a home and distributing to a plurality of IRDs.	The ODU splits the composite signal inside a home and distributes to a plurality of IRDs as described below:  The DPH42 communicates transponder signals from one or more LNBFs (such as the DP/DPP LNBF or DP LNBF) to an IRD (e.g. a Wally or ViP Receiver) over a single cable.

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		<p>The diagram illustrates the DISH satellite television services architecture. It starts with an Optical Distribution Unit (ODU) at the top. Two LNBFs (Low Noise Block Down Converters) are connected to the ODU via a single cable. One LNBF is labeled "DP/DPP LNBF" and the other is "DP LNBF". The ODU is also connected to a "Wally Network" via a single cable. The Wally Network then connects to multiple IRDs (Integrated Receiver Decoders). Each IRD is connected to multiple receivers, such as "Hopper, Wally, or VIP Receiver" and "Joey". The diagram shows how signals are distributed from a central ODU to multiple households via a coaxial network.</p>
19	19. The method of claim 14 wherein the transponder request signal is transmitted over the cable from an IRD and all IRDs receive the same composite signal as described below:	The transponder request signal is transmitted over the cable from an IRD and all IRDs receive the same composite signal as described below:

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	and all IRDs receive the same composite signal.	<p>The diagram illustrates the DISH satellite television services architecture. It starts with a satellite dish and a DP LNBF (Low Noise Block Downconverter) which feeds into an ODU (Optical Distribution Unit). A single cable from the ODU connects to a central Wally Network. From the Wally Network, three single cables branch out to three separate IRD (Integrated Receiver Decoder) units. Each IRD unit contains multiple tuners (labeled 'dsh') and is connected to a coaxial splitter.</p>
21a	21. The method of claim 14 further comprising the steps of:	See claim 14 analysis.

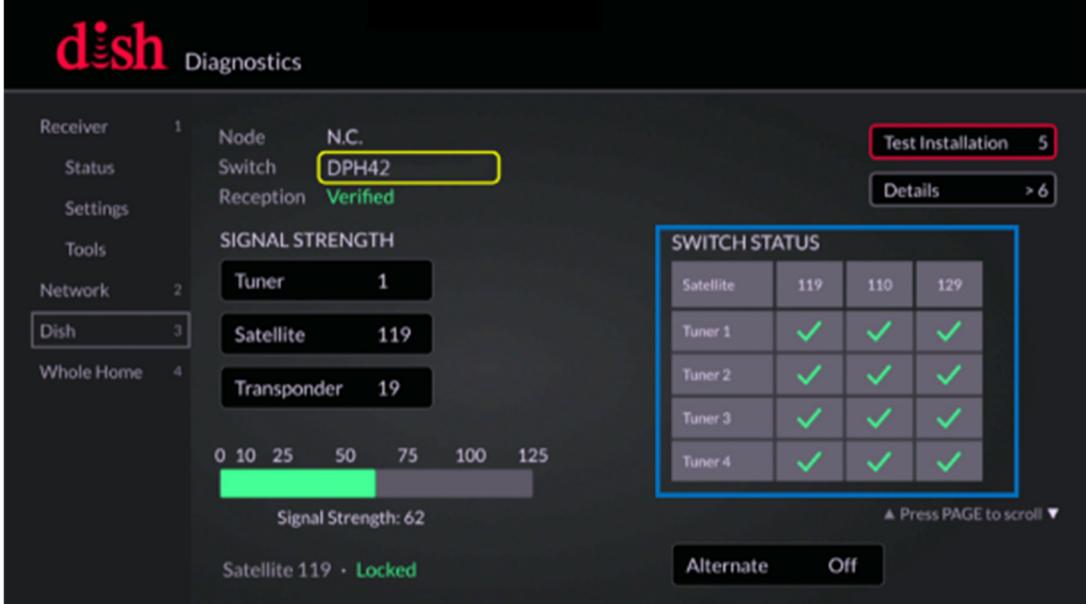
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<b>21b</b>	frequency translating the selected transponder channels to a variable frequency before combining; and	See claim 16 analysis.
<b>21c</b>	splitting the composite signal inside a home and distributing to a plurality of IRDs.	See claim 18 analysis.
<b>22</b>	22. The method of claim 21 wherein the transponder request signal is transmitted over the cable from an IRD.	<p>The transponder request signal is transmitted over the cable from an IRD as described below:</p> <p>The DPH42 communicates transponder signals from one or more LNBs (such as the DP/DPP LNB or DP LNB) to an IRD (e.g. a Wally or ViP Receiver) over a single cable.</p>

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		<p>Each of the ODUs receives a plurality of satellite broadband signals (highlighted in blue).</p>

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		 <p>The image shows the DISH Diagnostics interface. At the top, it displays 'Receiver' information: Node (N.C.), Status (Switch DPH42), Reception (Verified). There are links for 'Test Installation' and 'Details'. Below this is a 'SIGNAL STRENGTH' section with a bar graph showing Signal Strength at 62. It lists 'Tuner 1' (1), 'Satellite 119' (119), and 'Transponder 19' (19). A scale from 0 to 125 is shown below the graph. A 'SWITCH STATUS' grid shows four tuners (Tuner 1-4) across four satellites (119-129). All entries in the grid have a green checkmark. A note at the bottom says '▲ Press PAGE to scroll ▼'.</p>
34	34. The method of claim 14, wherein selecting and extracting comprises applying a pass band filter transfer function to the digitized broadband signal as described below:	Upon information and belief, the selecting and extracting comprises applying a pass band filter transfer function to the digitized broadband signal as described below:

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		<p><b>Technology Advantages:</b></p> <ul style="list-style-type: none"> <li>▪ <u>Drives future TV</u>: leapfrogs current analog architecture by moving to digital and supporting up to 24 minimally spaced channels; opens up the ability to stream independent HD broadcast streams and IP services from a single cable to multiple connected devices, delivering next-generation satellite TV.</li> <li>▪ <u>Simplifies installation and upgrades</u>: Broadcom's stacked channel technology allows single cable installation, which significantly reduces the cost and complexity for installs and upgrades with better home theater aesthetics for subscribers.</li> <li>▪ <u>Full-Band Capture (FBC)</u>: Broadcom's digital tuning technology digitizes the entire spectrum enabling more efficient and flexible distribution of video streams and IP services.</li> <li>▪ <u>Lower system cost</u>: replaces multiple analog ODU chips with a single lower cost mixed signal chip.</li> </ul>
36	36. The method of claim 14, wherein the combining is performed in the digital domain.	The ODU performs the combining in the digital domain as described below:

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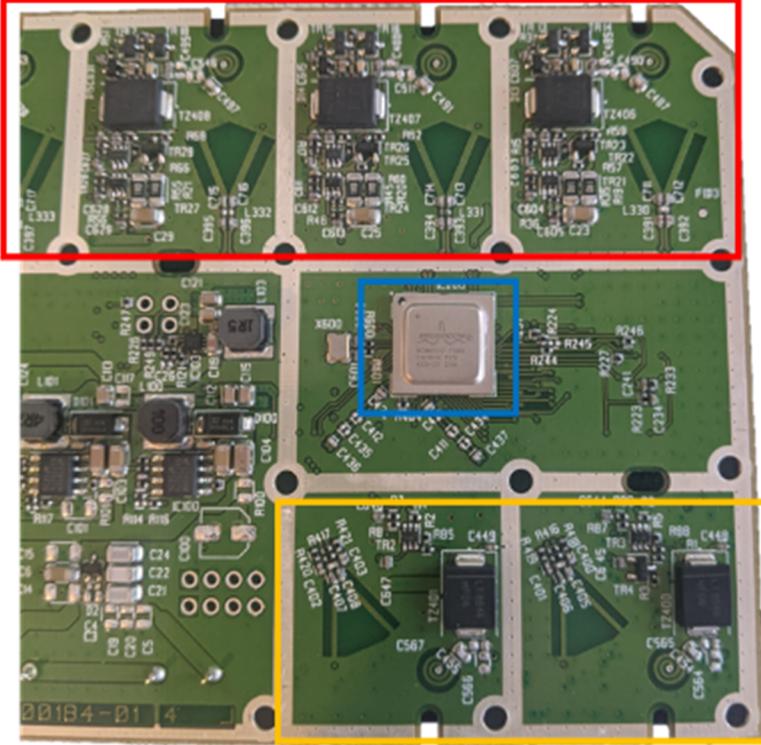
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		<p><b>Technology Advantages:</b></p> <ul style="list-style-type: none"> <li>▪ <u>Drives future TV</u>: leapfrogs current analog architecture by moving to digital and supporting up to 24 minimally spaced channels; opens up the ability to stream independent HD broadcast streams and IP services from a single cable to multiple connected devices, delivering next-generation satellite TV.</li> <li>▪ <u>Simplifies installation and upgrades</u>: Broadcom's stacked channel technology allows single cable installation, which significantly reduces the cost and complexity for installs and upgrades with better home theater aesthetics for subscribers.</li> <li>▪ <u>Full-Band Capture (FBC)</u>: Broadcom's digital tuning technology digitizes the entire spectrum enabling more efficient and flexible distribution of video streams and IP services.</li> <li>▪ <u>Lower system cost</u>: replaces multiple analog ODU chips with a single lower cost mixed signal chip.</li> </ul>
37	37. The method of claim 17, wherein frequency translating comprises using a digital mixer to apply a rotating phasor to the data samples to translate their frequency.	<p>Upon information and belief, the frequency translating comprises using a digital mixer to apply a rotating phasor to the data samples to translate their frequency as described below:</p> <p><b>Technology Advantages:</b></p> <ul style="list-style-type: none"> <li>▪ <u>Drives future TV</u>: leapfrogs current analog architecture by moving to digital and supporting up to 24 minimally spaced channels; opens up the ability to stream independent HD broadcast streams and IP services from a single cable to multiple connected devices, delivering next-generation satellite TV.</li> <li>▪ <u>Simplifies installation and upgrades</u>: Broadcom's stacked channel technology allows single cable installation, which significantly reduces the cost and complexity for installs and upgrades with better home theater aesthetics for subscribers.</li> <li>▪ <u>Full-Band Capture (FBC)</u>: Broadcom's digital tuning technology digitizes the entire spectrum enabling more efficient and flexible distribution of video streams and IP services.</li> <li>▪ <u>Lower system cost</u>: replaces multiple analog ODU chips with a single lower cost mixed signal chip.</li> </ul>
38	38. The method of claim 14, further comprising frequency translating the digitized broadband signal	The ODU frequency translates the digitized broadband signal prior to selecting and extracting transponder signal as described below:

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	prior to selecting and extracting transponder signal.	<p><b>Technology Advantages:</b></p> <ul style="list-style-type: none"> <li>• <i>Drives future TV</i>: leapfrogs current analog architecture by moving to digital and supporting up to 24 minimally spaced channels; opens up the ability to stream independent HD broadcast streams and IP services from a single cable to multiple connected devices, delivering next-generation satellite TV.</li> <li>• <i>Simplifies Installation and upgrades</i>: Broadcom's stacked channel technology allows single cable installation, which significantly reduces the cost and complexity for installs and upgrades with better home theater aesthetics for subscribers.</li> <li>• <i>Full-Band Capture (FBC)</i>: Broadcom's digital tuning technology digitizes the entire spectrum enabling more efficient and flexible distribution of video streams and IP services.</li> <li>• <i>Lower system cost</i>: replaces multiple analog ODU chips with a single lower cost mixed signal chip.</li> </ul>
39	39. The method of claim 38, wherein frequency translating comprises translating the original digitized broadband signal to locate a selected transponder channel at baseband.	<p>The frequency translating comprises translating the original digitized broadband signal to locate a selected transponder channel at baseband as described below:</p> <p><b>Technology Advantages:</b></p> <ul style="list-style-type: none"> <li>• <i>Drives future TV</i>: leapfrogs current analog architecture by moving to digital and supporting up to 24 minimally spaced channels; opens up the ability to stream independent HD broadcast streams and IP services from a single cable to multiple connected devices, delivering next-generation satellite TV.</li> <li>• <i>Simplifies Installation and upgrades</i>: Broadcom's stacked channel technology allows single cable installation, which significantly reduces the cost and complexity for installs and upgrades with better home theater aesthetics for subscribers.</li> <li>• <i>Full-Band Capture (FBC)</i>: Broadcom's digital tuning technology digitizes the entire spectrum enabling more efficient and flexible distribution of video streams and IP services.</li> <li>• <i>Lower system cost</i>: replaces multiple analog ODU chips with a single lower cost mixed signal chip.</li> </ul>
40	40. The method of claim 14, further comprising maintaining a channel translation table at the	Upon information and belief, the ODU maintains a channel translation table at the outdoor unit, the channel translation table specifying assigned frequency slots for transponder channels in the composite signal.

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	outdoor unit, the channel translation table specifying assigned frequency slots for transponder channels in the composite signal.	
41	41. The method of claim 38, further comprising providing the channel translation table to the IRD to allow the IRD to tune to a desired selected translated transponder channel.	<p>Upon information and belief, the ODU provides the channel translation table to the IRD to allow the IRD to tune to a desired selected translated transponder channel as described below:</p>  <p>The image shows the DISH Diagnostics interface. On the left, there's a navigation menu with 'Receiver' (1), 'Node' (N.C.), 'Status' (Switch DPH42, Reception Verified), 'Settings', 'Tools', 'Network' (2), 'Dish' (3), and 'Whole Home' (4). In the center, there's a 'SIGNAL STRENGTH' section with a bar from 0 to 125, currently at 62. Below it, it says 'Signal Strength: 62'. To the right is a 'SWITCH STATUS' grid for 'Tuner 1' through 'Tuner 4' across 'Satellite', '119', '110', and '129'. All entries in the grid have green checkmarks. At the bottom, there are buttons for 'Alternate' and 'Off', and a note '▲ Press PAGE to scroll ▼'.</p>

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42	42. The method of claim 14, wherein selecting and extracting comprises low-pass filtering the translated digitized broadband signal thereby substantially removing signal information from non-selected transponder channels.	<p>Upon information and belief, the selecting and extracting comprises low-pass filtering the translated digitized broadband signal thereby substantially removing signal information from non-selected transponder channels as described below:</p> <p><b>Technology Advantages:</b></p> <ul style="list-style-type: none"> <li>• <i>Drives future TV:</i> leapfrogs current analog architecture by moving to digital and supporting up to 24 minimally spaced channels; opens up the ability to stream independent HD broadcast streams and IP services from a single cable to multiple connected devices, delivering next-generation satellite TV.</li> <li>• <i>Simplifies installation and upgrades:</i> Broadcom's stacked channel technology allows single cable installation, which significantly reduces the cost and complexity for installs and upgrades with better home theater aesthetics for subscribers.</li> <li>• <i>Full-Band Capture (FBC):</i> Broadcom's digital tuning technology digitizes the entire spectrum enabling more efficient and flexible distribution of video streams and IP services.</li> <li>• <i>Lower system cost:</i> replaces multiple analog ODU chips with a single lower cost mixed signal chip.</li> </ul>